

DOCKET NO: 200741US61

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
CHRISTIAN MARZOLIN, ET AL. : EXAMINER: BOYD, J. A.
SERIAL NO: 09/719,153 :
RCE FILED: JUNE 20, 2003 : GROUP ART UNIT: 1771
FOR: SUBSTRATE WITH A :
PHOTOCATALYTIC COATING :

REPLY BRIEF

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

This is a Reply Brief in response to the Examiner's Answer dated February 1, 2006.

I. STATUS OF CLAIMS

Claims 1-11, 13-18, and 20-21 stand finally rejected in the Final Office Action mailed February 25, 2005.

II. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Appellants respectfully request the Board to review in this Appeal the rejection of Claims 1-11, 13-18, and 20-21 under the written description of 35 U.S.C. § 112, first paragraph.

III. ARGUMENT

A. "Takes into consideration" encompasses the scope of "comparable"

Independent Claim 1 recites, *inter alia*, a photocatalytic coating material that "coats fibers in the portion of the fibrous material over a thickness of between 30 and 50 nm, which is **comparable** to a mean size of crystallites of the at least partially crystallized titanium oxide in anatase form." (Emphasis added.) Independent Claim 13 recites a similar feature. The Appeal Brief filed November 1, 2005, indicates in the Summary of the Claimed Subject Matter section the required support in the specification for the above noted features of Claim 1.

In particular, the original specification discloses at page 10, lines 9-15, that a photocatalytic coating material coats fibers in the portion of the fibrous material over a thickness of between 30 and 50 nm. The specific thickness of the photocatalytic coating material, between 30 and 50 nm, "**takes into account** the most commonly encountered mean size of the anatase TiO₂ crystallites," as described in the original specification at page 10, lines 16-21. (Emphasis added.)

With respect to the rejection of Claims 1-11, 13-18, and 20-21 under 35 U.S.C. § 112, first paragraph, the Examiner's Answer states that "the phrase '**takes into account**' is a very broad limitation and does not necessarily require that the size is **comparable** to the mean size of the crystalline."¹ (Emphasis added.)

Appellants note that the breath of the term "comparable" is encompassed by the breath of the phrase "takes into account." Therefore, Claims 1 and 13 amended to recite the term "comparable" have a scope encompassed by the scope of the disclosure found in the specification at page 10, lines 16-21.

¹ Examiner's Answer, paragraph bridging pages 3 and 4.

It is noted the following pertinent discussion from *In re Wertheim*, 191 USPQ 90, 96 (CCPA 1976):

It is not necessary that the application describe the claim limitations **exactly**, *In re Lukach*, supra, but only so clearly that persons of ordinary skill in the art will recognize from the disclosure that appellants invented processes including those limitations. *In re Smythe*, 480 F.2d 1376, 1382, 178 USPQ 279, 284 (CCPA 1973). (Emphasis added.)

Thus, as discussed in the Arguments section of the Appeal Brief filed on November 1, 2005, the question that must be answered is not whether the application originally filed in the PTO used exactly the same words that appear in amended independent Claims 1 and 13. Instead, the question to be answered is whether the originally filed application “clearly conveyed in any way to those skilled in the art” what Appellants invented. *See id.*

In this last regard, amended independent Claims 1 and 13 recite a feature that one of ordinary skill in the art would have been understood by reading the original specification. In particular, the one of ordinary skill in the art would have understood from Figure 3, for example, that the mean size of the crystallites of the at least partially crystallized titanium oxide in anatase form is upper bounded in the claimed range because Figure 3 is a figure at scale which provides a 500 nm segment for comparison of the shown particles. As can be seen in Figure 3, the majority of the particles have a size around one tenth of the 500 nm segment, i.e. 50 nm. Thus, for those particles that include only one crystallite, the crystallite has a size of about 50 nm, as claimed. Crystallites having a size smaller than 50 nm are also possible in Figure 3.

In addition, Appellants note that both Claims 1 and 13 recite that the thickness of the photocatalytic coating material is between 30 and 50 nm, which finds support in the specification and provides sufficient disclosure to the one skilled in the art whether or not that range is comparable with the mean size of the crystallites.

Therefore, Appellants respectfully submit that the size of the mean crystallites being comparable to the claimed thickness range is supported by the originally filed specification.

B. Crystallites and Crystalline particles

It is noted that the Examiner's Answer at page 5, lines 1-2, distinguishes the "agglomerated particles" and "crystalline particles" from "crystallites." The Examiner's Answer provides for the first time as evidence for this differentiation the web note "Application of Powder Diffraction for study of Nanomaterial," from the website www.xrd.us. However, this web note further states that "[p]articles could compose (and most often they do) from several or many small crystallites." Thus, the web note relied upon by the Examiner's answer supports the fact that a particle might be composed of only two crystallites. Thus, if the average size of the particle is 80 nm, the average size of the crystallite is 40 nm, i.e., the size of the particle divided by the number of crystallites forming the particle.

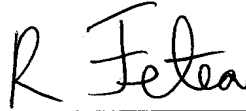
The Specification disclosure at page 14, lines 8-12 is that a solution includes "a dispersion of particles of TiO₂ crystallized in anatase form, probably composed of crystallite agglomerates, these agglomerates having a mean size of the order of 20 to 80 nm." (Emphasis added).

Thus, if one TiO₂ particle includes only two crystallites (which is likely), the mean size of the crystallites forming the particle is in the order of 10 to 40 nm, which is comparable to the claimed thickness of 30 to 50 nm. The 10 to 40 nm range is obtained by dividing the 20 to 80 nm range of the mean size of the particle by the number (two) of the crystallites forming the particle.

Accordingly, it is respectfully submitted that the claim amendments are supported by the specification and the rejection of Claims 1 and 13, as well as Claims 2-11, 14-18 and 20-21 (see page 3, lines 2-3 of the new Final Office Action) under the written description requirement of 35 U.S.C. § 112, first paragraph, be reversed.

Respectfully submitted,

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